

BISC 429, Cancer Immunology

Units: 4 units

Spring 2024—Wed and Fri —Time: 2:00pm – 3:20 pm

Location: KAP 137

Instructor: Raffaella Ghittoni, Ph.D.

Office: ZHS-256

Office Hours: TBD

Contact Info: rghitton@usc.edu, ph:213-740-8352

Persona Meeting Zoom Room:

<https://usc.zoom.us/j/5162230860?pwd=YnczdFJub0YySHJkTWVVM1Z0Q0lnZz09>

Meeting ID: 516 223 0860

Passcode: 2u306v

Course Description

Cancer immunology is a branch of immunology that studies interactions between the immune system and cancer cells (also called tumors or malignancies). This course has a single-discipline perspective approach to provide students with the necessary background and scientific tools to understand the role of the immune system in oncogenesis. The course serves as an ideal primer for students who seek an entry point to the domain of cellular transformation, carcinogenesis and immune surveillance. Cancer immunology is a growing field of research that aims to discover innovative cancer immunotherapies to treat and retard progression of the disease. Currently adopted immune-based therapies and new possible approaches in cancer treatment are extensively discussed all along the course. Guest lectures from selected invited speakers have been hosted in class to give students the possibility to meet, talk and interact with professional experts of this field.

Learning Objectives

In this course students will have the possibility to acquire knowledge on the main current topics related to the human immune system and cellular transformation and carcinogenesis.

After an introductory section on terminology and general aspects on cellular transformation, the course will mainly focus on key aspects in the interplay between the immune response and the establishment of malignancies as risk factors in carcinogenesis with an in depth on pathogen related factors, the impact of tumor affecting directly the immune system, the fundamental role of immune cells surveillance, cytokines and inflammation in carcinogenesis.

Seminars: One (or two) class meeting will consist of a research seminar presentation by an invited member who is conducting fundamental or clinical cancer research. This will be followed by a discussion. This will give students the possibility to meet, talk and interact with professionals of this field. Seminars will be scheduled depending on our guest's availability and research area to coordinate with appropriate class topics.

Students group presentation: During the semester students will have to organize in groups of two and select a research paper related to the topics discussed in class. Each group will be evaluated for critically presenting the paper in the discussion session and for participating as discussant during other group presentations. The course readings are based on suggested textbooks and current scientific literature (experimental and reviews publications)

Course Textbook: Robert Weinberg. The Biology of Cancer (2nd edition). Garland Science

Prerequisites: none

Recommended Preparation: Biology/Biochemistry majors, or graduate students enrolled in biological sciences. Registration is limited to 20 students. Familiarity with Molecular Biology, Genetics, Principles of Immunology is assumed.

Course Notes

Course grading distribution:

Midterm I	25%
Midterm II	25%
Presentation	25%
Final exam	25%

Description and Assessment of Assignments

Tests and final exams are marked on a numerical basis and then converted to letter grades. All scores are posted in your GRADEBOOK unless noted. If you notice a mistake or missing score(s) in the gradebook, it is student's responsibility to notify the course instructor as soon as possible.

Course Policies:

1) Exam dates are firm. There are no makeup exams in the course. Performance on the final may be prorated to substitute for a missing midterm exam, if an excuse considered valid by faculty is presented in a timely fashion. An acceptable written excuse or documentation must be provided to the faculty. The final exam will be administered only on the date and time set by the University.

2). Midterm exams will be returned to students by the professor during lectures. The final examination will not be returned but will be retained for one semester by the faculty.

3) Regrades: If you think an answer you have provided was graded incorrectly or if there is an arithmetic error, you may seek a regrade. You must provide a written explanation of why you think your answer was graded incorrectly. Regrade requests are to be submitted to your instructor. If a regrade is agreed upon, then the ENTIRE EXAMINATION may be subject to a regrade. Your grade may therefore go up, go down, or remain the same. Regrade requests must be received within one week of when the exam key is posted for midterms, or by the second week of classes the following semester for the final exam.

4) No special assignments for extra credit are permitted.

5) Academic integrity policies of the University will be strictly followed. Infractions can result in severe penalties. There may be assigned seating for exams. No student may be admitted to an exam after the first student has left the exam.

7) It may be necessary to make adjustments to the syllabus during the semester. Check the course website or class announcements on Blackboard for updates. Exam dates will not be changed.

8) Any questions or concerns regarding these policies should be addressed to the faculty.

9) Statement on Academic Conduct and Support Systems

All USC students are responsible for reading and following the Student Conduct Code, which appears in the SCampus and at <https://scampus.usc.edu/university-student-conduct-code/>. This policy does not apply to discussion or exchange of ideas. On the contrary, such interactions represent an important way to clear programming hurdles.

Course Schedule:

	Topics Covered	
Jan 10	Cancer and the human immune system– Course introduction	
Jan 12	The biology and genetics of cells and organisms (part I)	Ch.1.5 /12.9
Jan 17	The biology and genetics of cells and organisms (part II)	Ch.1
Jan 19	The Nature of Cancer - Terminology and common types of cancer (part I)	Ch.2
Jan 24	The Nature of Cancer - Terminology and common types of cancer (part II)	Ch.2
Jan 26	The Nature of Cancer - Terminology and common types of cancer (part III)	Ch.2
Jan 31	Oncoviruses (part I)	Ch.3
Feb 2	Oncoviruses (part II)	Ch.3
Feb 7	Tumor viruses (part III) Human Papilloma Virus and carcinogenesis	Review
Feb 9	MIDTERM I	
Feb 14	Guest Lecture: TBD	Slides ppt
Feb 16	Oncogenes/Tumor suppressor genes	Ch.9 + Ch 11
Feb 21	Human Immune system	Ch 15
Feb 23	Inflammation and cancer –part I	Ch.11
Feb 28	Inflammation and cancer part II - Obesity	Ch.9
Mar 1	Immunosurveillance part I	Ch 15
Mar 6	Guest Lecture: TBD	Slides ppt
Mar 8	Immunosurveillance part II	Selected article
Mar 13	Spring recess	
Mar 15	Spring recess	
Mar 20	Tumor antigens I	Ch. 15
Mar 22	Tumor antigens II	Ch. 15
Mar 27	Midterm II	
Mar 29	Immunosurveillance evasion I	Ch.15
Apr 3	Immunosurveillance evasion II	Ch. 15
Apr 5	Antibodies and Cell-Based immunotherapy – Vaccines	Ch. 15
Apr 10	Guest Lecture: TBD	Slides ppt
Apr 12	Student presentation	Selected article
Apr 17	Students presentation	Selected article
Apr 19	Students presentation	Selected article
Apr 24	Students presentation	Selected articles
Apr 26	Students presentation	Selected articles
May 6	Monday Final Examination from 2 to 4 pm	Kap 137

Statement on Academic Conduct and Support Systems

Academic Integrity:

The University of Southern California is a learning community committed to developing successful scholars and researchers dedicated to the pursuit of knowledge and the dissemination of ideas. Academic misconduct, which includes any act of dishonesty in the production or submission of academic work, compromises the integrity of the person who commits the act and can impugn the perceived integrity of the entire university community. It stands in opposition to the university's mission to research, educate, and contribute productively to our community and the world.

All students are expected to submit assignments that represent their own original work, and that have been prepared specifically for the course or section for which they have been submitted. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s).

Other violations of academic integrity include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), collusion, knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university. All incidences of academic misconduct will be reported to the Office of Academic Integrity and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see the student handbook or the Office of Academic Integrity's website, and university policies on Research and Scholarship Misconduct.

Please ask your instructor if you are unsure what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.

Students and Disability Accommodations:

USC welcomes students with disabilities into all of the University's educational programs. The Office of Student Accessibility Services (OSAS) is responsible for the determination of appropriate accommodations for students who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems:

Counseling and Mental Health - (213) 740-9355 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

988 Suicide and Crisis Lifeline - 988 for both calls and text messages – 24/7 on call

The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL) – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

Office for Equity, Equal Opportunity, and Title IX (EEO-TIX) - (213) 740-5086

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

The Office of Student Accessibility Services (OSAS) - (213) 740-0776

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

USC Campus Support and Intervention - (213) 740-0411

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity, Equity and Inclusion - (213) 740-2101

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call

Non-emergency assistance or information.

Office of the Ombuds - (213) 821-9556 (UPC) / (323-442-0382 (HSC)

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

Occupational Therapy Faculty Practice - (323) 442-2850 or otfp@med.usc.edu

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.